

SOLUTION BRIEF

Strategic Alliances
AI-Enabled Applications



AI-Performance Enhancements in Adobe Sensei* On-Device SDK with OpenVINO™ Toolkit

Working together, Adobe and Intel added the capabilities of the Intel® Distribution of OpenVINO™ toolkit to the Adobe Sensei* on-device SDK, maximizing performance and streamlining workflows.

“Leveraging more than a decade of experience in AI and machine learning coupled with our deep expertise spanning the creation and delivery of digital experiences, Adobe Sensei blends the art of human creativity with the science of data. It helps creators deliver smarter, more efficient experiences faster—handling mundane or time-consuming tasks to free them to focus on what matters most. Adobe Sensei powers dozens of intelligent features and capabilities across nearly every Adobe solution, which helps our customers and partners streamline and optimize their workflows.

- Scott Prevost,
Vice President of Engineering,
Adobe Sensei



Executive Summary

With a long and ongoing history of collaborative engineering, Adobe and Intel recently achieved another technology milestone, adding the Intel® Distribution of OpenVINO™ toolkit components and its open sourced distribution to the Adobe Sensei* on-device Software Development Kit (SDK). Through Adobe Sensei, Adobe has been increasingly incorporating artificial intelligence (AI) capabilities into its applications. This OpenVINO integration lets Adobe's developers directly gain the performance benefits of Intel-tuned libraries, frameworks, and other optimizations—natively.

Adobe Sensei* Overview

Adobe Sensei technology powers the intelligence spanning the entire Adobe solution portfolio. Within a unified AI and machine learning framework, Adobe Sensei improves digital experiences, providing faster searches, predictive analytics, personalized operations, a wide range of digital effects, and other enhancements.

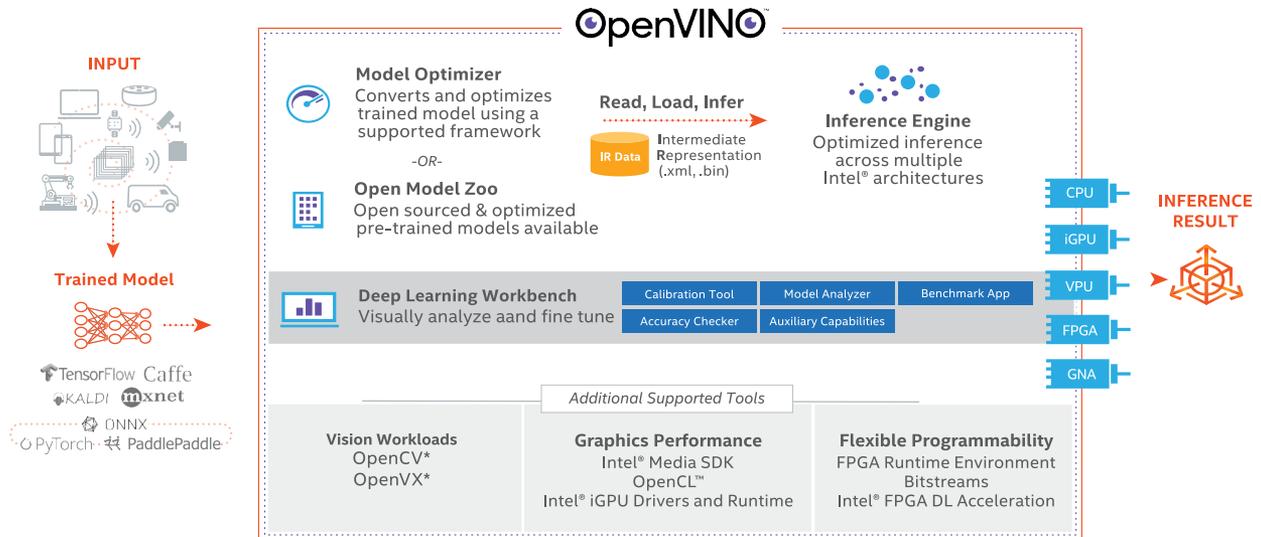
Two Photoshop* Elements 2020 features were built using the Adobe Sensei on-device SDK, which now includes the OpenVINO toolkit: Colorize Photo and Smooth Skin. Two new features have also been added to the Photoshop family of products. The first feature, Select Subject, lets users make an automatic selection of an image region for editing with a single click. The second, Object Selection Tool, uses AI techniques to simply and precisely select an object with the click-and-drag Marquee or Lasso.

An AI model trained and deployed on a Windows* system needs to run equally well on an OS X* machine, and vice versa. The Adobe Sensei on-device SDK enables cross-platform interoperability at the operating system level, saving Adobe's developers from many hours of extra work building different OS-specific implementations of AI models. Months of co-engineering work by Intel and Adobe strengthened OpenVINO toolkit's cross-platform performance.

Contents of the OpenVINO™ Toolkit

Intel originally introduced the OpenVINO toolkit to the open source community to enhance and accelerate AI operations on Intel® architecture-based hardware, including CPU, integrated GPU, VPU, FPGA, and GNA. The plug-in design of the architecture supports interoperability with many open source projects and major frameworks, including FFMPEG and gstreamer for media, and TensorFlow*, Apache MXNet*, Kaldi*, ONNX*, and Caffé* for deep learning operations.

UNDER THE HOOD: INTEL® DISTRIBUTION OF OPENVINO™ TOOLKIT



By integrating these toolkit components into the Adobe Sensei on-device SDK, all the functionality and capabilities become accessible in a direct and convenient way for developers, helping reduce time-to-market and strengthening the integrity and reliability of application code through the interoperability and streamlined experience the OpenVINO toolkit adds onto the SDK.

Solution Benefits

Incorporating OpenVINO toolkit functionality into the Adobe Sensei on-device SDK enables performance-tuned inference operations on Intel architecture-based systems. The solution benefits of this embedded SDK that can now easily be realized in solutions developed by Adobe include:

- Trained AI models can be deployed across the full range of Intel®-based hardware with support for plug-ins, including CPUs, integrated GPUs, and more.
- Adobe’s developers can validate and optimize AI operations and ensure efficient execution on Intel architecture-based systems.
- One easy-to-use, runtime API supports a wide range of different Intel architecture-based hardware.
- A model optimizer that can fuse layers significantly reduces file sizes and boosts performance.

Future AI Strategy

The collaborative work between Adobe and Intel continues as both companies strive to emphasize the benefits of AI-based technology and envision co-engineered solutions that take full advantage of available hardware and software functionality and capabilities.

For more information about OpenVINO toolkit, visit <https://software.intel.com/en-us/opencv-toolkit>.

“This new Sensei-powered tool [Object Selection Tool] is designed to accelerate your selection workflow so you can spend more time creating. If I want to select all the subjects, I just click-and-drag a box around them. It’s like it reads your mind and shrink-wraps the object with the selection.”¹
 - Meredith Stotzner, Adobe Photoshop Product Manager

Enhanced Photoshop* Elements Features

Two Photoshop Elements features leveraging the Adobe Sensei on-device SDK are:

Colorize Photo: This feature, powered by Adobe Sensei technology, intelligently adds realistic colors to black-and-white photo images.

Smooth Skin: Another Sensei-enabled feature, Smooth Skin, subtly makes improvements to skin tone and diminishes flaws for a more pleasing appearance.

These enhanced capabilities leverage the OpenVINO toolkit.

About Adobe

Based in San Jose, California, Adobe gives everyone—from emerging artists to global brands—everything they need to design and deliver exceptional digital experiences.

For more information about Adobe Sensei, visit <https://www.adobe.com/sensei.html>.

End Notes

¹ Photoshop Sneak Peek Object Selection Tool. Adobe. October 2019.
<http://www.youtube.com/watch?v=0Qm5nS2PMBs&feature=youtu.be>

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